

TABLE 2.—Free-air resultant winds (meters per second) based on pilot-balloon observations made near 5 a. m. (E. S. T.) during April 1936

[Wind from N=360°, E=90°, etc.]

Altitude (m) m. s. l.	Albu- querque, N. Mex. (1,554 m)		Atlanta, Ga. (309 m)		Billings, Mont. (1,088 m)		Boston, Mass. (15 m)		Cheyenne, Wyo. (1,873 m)		Chicago, Ill. (192 m)		Cincin- nati, Ohio (153 m)		Detroit, Mich. (204 m)		Fargo, N. Dak. (274 m)		Houston, Tex. (21 m)		Key West, Fla. (11 m)		Medford, Oreg. (410 m)		Murfrees- boro, Tenn. (180 m)	
	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity
Surface.....	335	0.9	290	0.9	299	1.4	266	1.9	284	3.4	294	0.3	259	0.6	269	1.4	329	1.0	15	1.7	74	2.2	108	0.2	202	0.9
500.....	263	2.0	263	4.1	284	4.7	286	8.9	294	9.8	294	9.8	259	2.7	284	3.1	343	2.8	122	2.0	95	3.6	308	.4	217	2.9
1,000.....	273	5.9	273	8.2	289	5.2	290	11.0	277	5.9	303	8.7	296	10.5	288	10.7	307	8.4	234	2.2	219	1.9	196	2.4	298	7.3
1,500.....	279	3.3	288	8.2	289	7.4	284	10.8	287	8.8	298	9.8	298	11.3	304	8.8	261	2.7	252	2.5	225	2.7	287	7.8	271	6.8
2,000.....	271	5.8	282	9.2	284	7.4	283	10.7	287	8.8	298	9.4	301	13.3	301	11.0	276	8.5	275	3.0	255	3.3	225	5.5	264	5.9
2,500.....	284	6.8	285	8.8	291	8.2	280	12.7	298	9.4	301	11.0	307	15.9	295	7.1	271	4.3	230	8.4	230	8.9	291	5.4		
3,000.....	291	5.4	304	7.8	297	7.4	307	15.9	284	6.2	295	7.1	295	7.1	295	7.1	295	7.1	271	4.3	230	8.4	291	5.4		
4,000.....	302	5.1	313	7.6	284	6.2	284	6.2	284	6.2	284	6.2	284	6.2	284	6.2	284	6.2	271	4.3	230	8.4	291	5.4		
5,000.....																										
Altitude (m) m. s. l.	Newark, N. J. (14 m)		Oakland, Calif. (8 m)		Oklahoma City, Okla. (402 m)		Omaha, Nebr. (306 m)		Pearl Har- bor, Terri- tory of Hawaii ¹ (68 m)		Pensacola, Fla. ¹ (24 m)		St. Louis, Mo. (170 m)		Salt Lake City, Utah (1,294 m)		San Diego, Calif. (15 m)		Sault Ste. Marie, Mich. (198 m)		Seattle, Wash. (14 m)		Spokane, Wash. (603 m)		Washing- ton, D. C. (10 m)	
	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity
Surface.....	265	2.1	199	0.7	182	1.9	36	0.7	266	1.5	253	0.9	138	2.2	360	0.1	331	1.8	150	1.5	139	0.9	291	1.8	277	4.8
500.....	277	6.9	288	2.5	177	5.2	110	0.8	189	1.2	241	3.8	148	5.2	333	1.9	342	3.8	201	2.6	223	2.5	276	6.7		
1,000.....	279	9.0	315	4.4	211	8.6	234	3.6	240	4.4	282	5.2	263	5.1	293	7.9	346	2.8	340	4.6	193	2.4	242	3.6		
1,500.....	276	9.1	321	3.0	245	6.6	269	6.3	278	7.3	290	9.0	287	7.5	296	9.4	262	2.3	320	3.0	255	3.4	223	4.2		
2,000.....	284	10.1	315	3.0	259	4.8	304	9.9	298	7.3	300	9.0	298	7.5	296	9.4	276	3.6	328	4.8	224	5.3	258	5.5		
2,500.....	287	12.9	321	3.8	278	4.5	310	11.0	287	7.5	300	9.4	299	6.6	300	9.4	276	3.6	328	4.8	221	5.7	257	5.9		
3,000.....	287	12.4	284	4.2	301	5.7	310	12.4	298	6.6	300	9.4	299	6.6	300	9.4	276	3.6	328	4.8	221	5.7	257	5.9		
4,000.....			299	5.8	312	12.0	299	5.8	299	5.8	299	5.8	295	7.5	295	7.5	283	6.5	338	8.3	233	7.0	266	8.2	250	10.8
5,000.....																										

¹ Navy stations.

RIVERS AND FLOODS

[River and Flood Division, MONTROSE W. HAYES in charge]

By W. J. MOXOM

The winter of 1935-36 was unusually cold over the region east of the Rocky Mountains, and the snowfall was the heaviest in many years in the country north of the Potomac, Ohio, and Missouri Rivers. These conditions usually bring about floods when there is a sudden melting of snow and breaking up of ice by rain and warm weather; and in March floods occurred in Iowa, Minnesota, and in all the States east of the Mississippi River, except Michigan. They were light to moderate, except along the Atlantic seaboard from Virginia northward and in the upper Ohio Valley, where they were extremely high and exceeded all previous records.

Late in February and early in March, mild, rainy weather caused rises and ice gorges in the rivers of Virginia and Maryland, and some damage resulted from ice movement, but the combined run-off from the rain and melted snow was insufficient to give injurious floods. New England, New York, and Pennsylvania were not so fortunate, and there was considerable damage from both the crushing effects of ice and from floodwaters.

By March 16 the streams in Virginia and Maryland had fallen considerably and a fall had begun north of Maryland. Conditions were approaching normal, but on March 17 a storm that originated on March 15 in Texas had moved to south-central North Carolina and was causing general rains over the Middle Atlantic seaboard and the upper Ohio Basin. These rains were phenomenally heavy in the country to the west of the Coastal Plains and along the divide between the eastern rivers

and the upper Ohio Basin. Amounts of nearly 5 inches occurred in 12 hours or less over a large area in the mountainous regions of Virginia, Maryland, and western Pennsylvania, and more than 6 inches fell at some stations in a period of 48 hours or less. The storm moved slowly in a northeasterly direction and the rains were heavy over all of the North Atlantic seaboard. To the northeastward the amounts were not so heavy, but from a flood-producing viewpoint the results were about the same, because the rivers in the southern part of the area under consideration were much lower at the beginning of the rain than they were in Pennsylvania, New York, and New England.

The rains fell on well-saturated and semifrozen soil, and the percentage of run-off was unusually high. This, coupled with the fact that the northern rivers were at or above flood stage, and those in Maryland and Virginia, while not in flood were higher than normal, gave the most disastrous floods of record in the James, Potomac, Susquehanna, Connecticut, and Merrimack Rivers, in some of the tributaries of the Ohio River in Pennsylvania and in the Ohio River from Pittsburgh, Pa., to below Wheeling, W. Va.

The Ohio River flood, which gave a record crest stage of 46.0 feet at Pittsburgh, Pa., on March 18, crested at Evansville, Ind., on March 31. The rise in the Ohio below Evansville was prolonged, due to early April floods in the Cumberland and Tennessee Rivers, and a crest stage of 52.8 feet occurred at Cairo, Ill., on April 16.

In the lower Mississippi River, flood stages were exceeded at all points between Cairo, Ill., and Helena, Ark. At Helena the crest was 50.6 feet on April 22-24. Flood stage was not reached below the mouth of the Arkansas River; and the crest of the rise reached New Orleans, La., on May 3, 1936, giving a stage of 14.4 feet which was 2.6 feet below flood stage at that place.

In April, river stages in the Carolinas were the highest since 1929, and the highest since 1916 at a few points in the Saluda Basin in South Carolina. Moderately high floods prevailed in Georgia and Alabama; they were light to moderate elsewhere. All of the rivers in North Carolina have been in flood one or more times during each month from January to April, inclusive, with high water prevailing in the lower portions for prolonged periods.

Flood losses in the Northeastern States in March were undoubtedly the greatest of record, but it is not practicable at this time to give the estimated money value. Several hundred thousand people were made homeless by the floodwaters and many homes were completely destroyed. The actual number of drownings may never be known, but unofficial figures place it at more than 170. Business was partially or completely paralyzed in many of the large industrial sections, and losses to wage earners and retailers amounted to large sums. In April rather large losses occurred in Alabama, Georgia and the Carolinas, but elsewhere they were light.

A full report of these floods will be made in a later number, or perhaps a supplement, of the MONTHLY WEATHER REVIEW, when all data are available.

The following table shows for a few stations the gage heights of the March 1936 flood, compared with the previous highest records:

Station	River	1936 stage	Previous record	
			Stage	Year
Columbia, Va.	James	35.9	35.4	1935
Richmond, Va.	do	26.5	23.6	1935
Hancock, Md.	Potomac	47.6	39.7	1889
Washington, D. C.	do	19.8	19.5	1889
Sunbury, Pa.	Susquehanna	26.8	21.0	1889
Harrisburg, Pa.	do	30.3	26.1	1889
Holyoke, Mass.	Connecticut	16.8	14.8	1927
Springfield, Mass.	do	28.6	22.4	1927
Hartford, Conn.	do	37.3	29.8	1854
Saltsburg, Pa.	Kiskiminetas	33.1	22.1	1859
McKeesport, Pa.	Monongahela	28.8	25.8	1907
Pittsburgh, Pa.	Ohio	46.0	41.1	1763
Old Dam No. 2, Coraopolis, Pa.	do	43.6	36.5	1907
Dam No. 6, Beaver, Pa.	do	54.8	46.6	1907
Dam No. 13, Wheeling, W. Va.	do	57.8	53.4	1884
Parkersburg, W. Va.	do	48.0	58.9	1913

Table of flood stages in March and April 1936

River and station	Flood stage	Above flood stages—dates		Crest		
		From—	To—	Stage	Date	
ST. LAWRENCE DRAINAGE						
<i>Lake Erie</i>						
Sandusky: Upper Sandusky, Ohio	Feet 13	Mar. 25	Mar. 25	Feet 13.7	Mar. 25.	
ATLANTIC SLOPE DRAINAGE						
Connecticut:						
White River Junction, Vt.	18	(Mar. 12	Mar. 14	19.8	Mar. 12.	
Bellows Falls, Vt.	16	(Mar. 17	Mar. 26	33.4	Mar. 19.	
Holyoke, Mass.	9	(Mar. 14	Mar. 16	9.9	Mar. 15.	
Springfield, Mass.	20	(Mar. 19	Mar. 25	16.8	Mar. 20.	
Hartford, Conn.	16	(Mar. 13	Mar. 24	38.6	Do.	
Mohawk: Tribes Hill, N. Y.	23	Mar. 18	Mar. 19	25.4	Mar. 18.	
Hudson: Albany, N. Y.	12	(Mar. 13	Mar. 20	15.1	Mar. 13.	
Lackawaxen: Hawley, Pa.	9	(Mar. 12	Mar. 12	13.4	Mar. 12.	
		(Mar. 17	Mar. 19	15.2	Mar. 18.	

Table of flood stages in March and April 1936—Continued

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
ATLANTIC SLOPE DRAINAGE—CON.					
Lehigh: Lehighton, Pa.	Feet 9	(Mar. 9	Mar. 12	11.3	Mar. 11.
		(Mar. 18	Mar. 19	13.1	Mar. 18.
Schuylkill: Reading, Pa.	10	(Mar. 12	Mar. 13	15.5	Mar. 12.
		(Mar. 18	Mar. 19	12.4	Mar. 18.
Delaware:					
Port Jervis, N. Y.	18	Mar. 18	Mar. 18	18.6	Mar. 18.
Phillipsburg, N. J.	22	(Mar. 12	Mar. 13	27.6	Mar. 12.
Trenton, N. J.	12	(Mar. 12	Mar. 20	30.7	Mar. 19.
		(Mar. 18	Mar. 13	15.5	Mar. 12.
Chenango:					
Sherburne, N. Y.	8	(Mar. 12	Mar. 13	9.6	Mar. 12.
		(Mar. 16	Mar. 22	10.6	Mar. 18.
Binghamton, N. Y.	16	(Mar. 11	Mar. 14	22.0	Mar. 13.
		(Mar. 16	Mar. 22	27.0	Mar. 18.
Chemung: Corning, N. Y.	16	(Mar. 12	Mar. 12	19.3	Mar. 12.
		(Mar. 18	Mar. 18	17.8	Mar. 18.
West Branch—Susquehanna:					
Clearfield, Pa.	10	do	Mar. 19	17.8	Do.
Renovo, Pa.	16	Mar. 17	do	29.3	Do.
Williamsport, Pa.	20	(Mar. 12	Mar. 13	23.7	Mar. 12.
		(Mar. 17	Mar. 20	33.7	Mar. 19.
Frankstown Branch: Huntingdon, Pa.	12	do	do	22.0	Mar. 18.
Juniata: Newport, Pa.	26	Mar. 18	Mar. 19	34.2	Mar. 19.
Susquehanna:					
Oneonta, N. Y.	12	Mar. 11	Mar. 25	19.5	Mar. 18.
Bainbridge, N. Y.	12	do	Mar. 14	18.0	Mar. 13.
		(Mar. 16	Mar. 22	21.5	Mar. 18.
Binghamton, N. Y.	14	(Mar. 12	Mar. 14	18.0	Mar. 13.
		(Mar. 17	Mar. 21	22.8	Mar. 18.
Towanda, Pa.	16	(Mar. 12	Mar. 14	22.3	Mar. 13.
		(Mar. 17	Mar. 21	25.0	Mar. 19.
Wilkes-Barre, Pa.	22	Mar. 12	Mar. 14	28.9	Mar. 13.
		(Mar. 17	Mar. 22	33.1	Mar. 20.
Sunbury, Pa.	20	Mar. 18	Mar. 20	26.8	Mar. 19.
		(Mar. 12	Mar. 14	21.8	Mar. 13.
Harrisburg, Pa.	18	(Mar. 18	Mar. 22	30.3	Mar. 19.
North Branch—Potomac: Cumberland, Md.	17	Mar. 17	Mar. 19	29.1	Mar. 18.
Shenandoah: Riverton, Va.	22	do	do	37.5	Do.
Potomac:					
Hancock, Md.	32	do	do	47.6	Do.
Harpers Ferry, W. Va.	18	Mar. 18	Mar. 20	36.5	Mar. 19.
Sycamore Island, Md.	11	do	Mar. 21	28.5	Do.
Washington, D. C.	8	do	do	19.8	Do.
James:					
Buchanan, Va.	17	Mar. 17	Mar. 19	28.0	Mar. 18.
Lynchburg, Va.	18	Mar. 18	do	24.7	Do.
		(Mar. 1	Mar. 1	10.2	Mar. 1.
		(Mar. 13	Mar. 13	10.2	Mar. 13.
Columbia, Va.	10	(Mar. 17	Mar. 31	35.8	Mar. 19.
		(Apr. 3	Apr. 4	10.5	Apr. 4.
		(Apr. 6	Apr. 15	17.1	Apr. 8.
Richmond, Va.	8	Mar. 18	Mar. 23	26.5	Mar. 20.
Dan:					
Danville, Va.	11	do	Mar. 18	12.7	Mar. 18.
Clarksville, Va.	13	do	Mar. 20	16.3	Mar. 20.
Roanoke:					
Randolph, Va.	18	do	Mar. 21	29.1	Mar. 19.
		(Apr. 7	Apr. 8	10.5	Apr. 8.
Weldon, N. C.	31	(Mar. 18	Mar. 24	44.8	Mar. 21.
		(Apr. 7	Apr. 13	38.1	Apr. 8, 9.
Williamston, N. C.	10	(Mar. 1	Mar. 3	10.5	Mar. 1.
		(Mar. 17	Apr. 24	14.0	Mar. 25.
Fishing Creek: Enfield, N. C.	14	(Apr. 8	Apr. 10	14.9	Apr. 9, 10.
Tar:					
Rocky Mount, N. C.	8	(Mar. 18	Mar. 22	9.4	Mar. 22.
		(Apr. 5	Apr. 12	11.1	Apr. 11.
		(Mar. 22	Mar. 24	18.5	Mar. 23.
Greenville, N. C.	13	(Mar. 21	Mar. 26	14.5	Mar. 24, 25.
		(Apr. 8	Apr. 18	18.2	Apr. 14.
Neuse, N. C.	14	(Mar. 18	Mar. 23	18.1	Mar. 20.
		(Apr. 4	Apr. 13	16.9	Mar. 29.
		(Apr. 4	Apr. 13	19.6	Apr. 9.
		(Mar. 18	Mar. 24	17.5	Mar. 23.
Smithfield, N. C.	13	Mar. 31	Mar. 31	13.4	Mar. 31.
		(Apr. 3	Apr. 15	20.7	Apr. 9.
		(Mar. 18	Mar. 19	25.8	Mar. 18.
Haw: Moncure, N. C.	20	(Apr. 3	Apr. 3	21.2	Apr. 3.
		(Apr. 7	Apr. 10	29.0	Apr. 7.
Cape Fear:					
Fayetteville N. C.	35	Mar. 18	Mar. 21	43.2	Mar. 19.
		(Apr. 4	Apr. 4	37.1	Apr. 4.
		(Apr. 7	Apr. 12	54.9	Apr. 8.
Lock No. 2 Elizabethtown N. C.	20	Mar. 18	Mar. 24	30.8	Mar. 20.
Lynches: Effingham S. C.	14	Mar. 29	Apr. 2	26.4	Mar. 30.
Waccamaw: Conway S. C.	7	(Apr. 4	Apr. 16	31.8	Apr. 10.
		(Apr. 8	Apr. 17	18.6	Apr. 12.
Peedee:					
Cheraw S. C.	30	Mar. 18	Mar. 20	36.2	Mar. 18.
		(Mar. 29	Mar. 30	34.9	Mar. 29.
		(Apr. 3	Apr. 5	37.2	Apr. 3.
		(Apr. 7	Apr. 12	42.8	Apr. 8.
Mars Bluff Bridge S. C.	17	(Mar. 15	Mar. 16	17.3	Mar. 15.
		(Mar. 20	Apr. 21	27.1	Apr. 11.
Poston S. C.	18	Mar. 24	Apr. 23	27.8	Apr. 13.

¹ Subject to correction when high water marks are tied in by leveling.

Table of flood stages in March and April 1936—Continued

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
ATLANTIC SLOPE DRAINAGE—CON.					
Black: Kingtree S. C.	Feet 12	Apr. 4	Apr. 17	Feet 13.1	Do.
Saluda:					
Pelzer S. C.	6	[Mar. 28	Mar. 30	7.0	Mar. 28.
		[Apr. 2	Apr. 13	15.0	Apr. 7.
Chappells S. C.	13	[Mar. 26	Mar. 30	19.0	Mar. 26.
Columbia S. C.	8	[Apr. 2	Apr. 13	28.6	Apr. 8.
		do	do	13.9	Do.
Broad: Blairs S. C.	14	[Mar. 27	Mar. 30	18.4	Mar. 29.
Congaree: Columbia S. C.	19	[Apr. 2	Apr. 11	33.8	Apr. 8.
Catawba:					
Catawba N. C.	10	[Apr. 2	Apr. 3	13.0	Apr. 2.
		[Apr. 6	Apr. 6	17.7	Apr. 6.
		[Mar. 28	Mar. 28	12.1	Mar. 28.
Catawba S. C.	11	[Apr. 2	Apr. 3	16.0	Apr. 3.
		[Apr. 7	Apr. 10	25.0	Apr. 7.
Wateree: Camden S. C.	23	[Mar. 20	Mar. 29	25.0	Mar. 29.
Santee:					
Rimini, S. C.	12	Feb. 5	Mar. 1	17.1	Feb. 10.
		Mar. 6	Mar. 7	12.1	Mar. 6.
		Mar. 12	Mar. 15	13.0	Mar. 14.
Ferguson, S. C.	12	[Jan. 6	Mar. 9	14.8	Jan. 26.
Broad: Carlton, Ga.	15	[Mar. 13	May 6	20.4	Apr. 12.
		[Apr. 2	Apr. 3	22.0	Apr. 2.
		[Apr. 6	Apr. 8	28.0	Apr. 7.
Savannah:					
Calhoun Falls, S. C.	8	do	do	11.5	Do.
Augusta, Ga.	32	[Apr. 2	Apr. 4	34.7	Apr. 3.
		[Apr. 6	Apr. 11	41.2	Apr. 8.
Ellenton, S. C.	14	[Mar. 19	Mar. 22	16.0	Mar. 21.
Clyo, Ga.	13	[Mar. 24	Apr. 28	36.9	Apr. 9.
Ogeechee:					
Midville, Ga.	6	Apr. 3	Apr. 16	9.1	Apr. 11.
Dover, Ga.	7	Apr. 3	Apr. 23	12.8	Apr. 14.
Ocmulgee:					
Macon, Ga.	15	Apr. 2	Apr. 11	25.1	Apr. 9.
Hawkinsville, Ga.	25	Apr. 6	Apr. 15	33.0	Apr. 12.
Abbeville, Ga.	11	Apr. 3	Apr. 21	19.7	Apr. 13.
Lumber City, Ga.	15	Apr. 7	Apr. 22	22.7	Apr. 16.
Oconee:					
Milledgeville, Ga.	22	Apr. 2	Apr. 12	36.8	Apr. 10.
Dublin, Ga.	22	Apr. 6	Apr. 17	33.4	Apr. 12.
Altamaha:					
Charlotte, Ga.	12	[Mar. 1	Mar. 2	12.9	Mar. 1.
Doctortown, Ga.	10	[Apr. 1	Apr. 27	27.9	Apr. 16.
		[Apr. 13	Apr. 23	12.0	Apr. 18.
EAST GULF OF MEXICO DRAINAGE					
Chattahoochee:					
West Point, Ga.	19	Apr. 7	Apr. 11	22.4	Apr. 8.
Eufaula, Ala.	40	Apr. 9	Apr. 13	50.4	Apr. 11.
Columbia, Ala.	42	Apr. 10	Apr. 14	46.7	Apr. 12.
Alaga, Ala.	32	Apr. 8	Apr. 15	40.5	Do.
Flint:					
Montezuma, Ga.	20	[Apr. 5	Apr. 5	20.4	Apr. 5.
		[Apr. 11	Apr. 13	22.8	Apr. 12.
Albany, Ga.	20	Apr. 7	Apr. 18	29.4	Apr. 15.
Bainbridge, Ga.	25	Apr. 11	Apr. 20	31.0	Apr. 17.
Apalachicola:					
River Junction, Fla.	20	Apr. 9	Apr. 18	25.8	Apr. 15.
Blountstown, Fla.	15	[Mar. 27	Mar. 9	17.6	Mar. 1, 2.
Choctawhatchee: Caryville, Fla.	12	Apr. 13	Apr. 13	12.2	Apr. 13.
Oostanaula:					
Resaca, Ga.	22	Apr. 2	Apr. 11	30.9	Apr. 3.
Rome, Ga.	25	do	Apr. 12	33.7	Apr. 8.
Etowah: Canton, Ga.	17	[Apr. 2	Apr. 3	23.0	Apr. 2.
		[Apr. 6	Apr. 7	22.3	Apr. 7.
Coosa:					
Mayos Bar Lock, Ga.	28	Apr. 2	Apr. 13	36.9	Apr. 8.
Gadsden, Ala.	20	Mar. 28	Apr. 18	31.5	Apr. 11, 12.
Lock No. 4, Lincoln, Ala.	17	Apr. 3	Apr. 17	23.5	Apr. 10.
Wetumpka, Ala.	45	Apr. 7	Apr. 14	50.6	Apr. 9.
Tallapoosa: Millstead, Ala.	40	do	Apr. 10	42.2	Apr. 10.
Cahaba: Centerville, Ala.	23	[Apr. 7	Apr. 7	25.0	Apr. 7.
		[Apr. 9	Apr. 9	25.5	Apr. 9.
Alabama:					
Montgomery, Ala.	35	Apr. 7	Apr. 18	51.5	Apr. 11.
Selma, Ala.	45	Apr. 9	Apr. 19	52.2	Apr. 14.
Millers Ferry, Ala.	40	Apr. 7	Apr. 23	52.0	Apr. 16.
Black Warrior: Lock No. 10, Tuscaloosa, Ala.	46	[Apr. 3	Apr. 5	51.3	Apr. 4.
		[Apr. 10	Apr. 11	49.5	Apr. 10.
Tombigbee:					
Aberdeen, Miss.	34	do	Apr. 12	36.3	Apr. 11.
Lock No. 4, Demopolis, Ala.	39	Apr. 1	Apr. 20	51.6	Apr. 12.
Lock No. 3, Ala.	33	Mar. 30	Apr. 22	53.1	Apr. 11.
Lock No. 2, Ala.	46	Apr. 4	Apr. 21	54.5	Apr. 11, 12.
Lock No. 1, Ala.	31	Apr. 3	Apr. 24	37.1	Apr. 13-18.
Pearl: Pearl River, La.	12	[Mar. 1	Mar. 3	13.6	Mar. 1.
		[Apr. 13	Apr. 16	12.1	Apr. 14.

Table of flood stages in March and April 1936—Continued

River and station	Flood stage	Above flood stages—dates		Crest		
		From—	To—	Stage	Date	
MISSISSIPPI SYSTEM						
Upper Mississippi Basin						
Minnesota: Mankato, Minn.	19	Mar. 22	Mar. 24	20.2	Mar. 23.	
Chippewa: Durand, Wis.	11	[Mar. 25	Mar. 26	11.5	Mar. 26.	
Wisconsin:						
Knowlton, Wis.	12	Mar. 24	Mar. 26	17.2	Mar. 24.	
Portage, Wis.	17	Mar. 29	Mar. 30	17.6	Mar. 29.	
Iowa: Wapello, Iowa.	10	Mar. 15	Mar. 20	11.6	Mar. 17, 18.	
Raccoon: Van Meter, Iowa.	13	Mar. 5	Mar. 6	14.0	Mar. 5.	
Des Moines:						
Tracy, Iowa.	14	[Mar. 4	Mar. 5	14.3	Do.	
Ottumwa, Iowa.	9	Mar. 4	Mar. 6	9.5	Mar. 6.	
Illinois:						
Morris, Ill.	13	Feb. 25	Mar. 1	14.5	Feb. 27.	
Peru, Ill.	17	Feb. 26	Mar. 8	21.7	Feb. 28.	
Peoria, Ill.	18	Mar. 1	Mar. 12	19.8	Mar. 4, 5.	
Havana, Ill.	14	Feb. 27	Mar. 22	18.0	Mar. 3, 4.	
Beardstown, Ill.	14	Feb. 28	Mar. 24	19.8	Mar. 4, 5.	
Mississippi:						
St. Paul, Minn.	8	Mar. 24	Apr. 5	10.9	Mar. 30.	
La Crosse, Wis.	12	Mar. 6	Mar. 11	11.9	Mar. 20.	
Keokuk, Iowa.	12	[Apr. 9	Apr. 12	12.3	Apr. 9.	
Hannibal, Mo.	13	[Mar. 17	Mar. 20	13.3	Mar. 18.	
		[Apr. 6	Apr. 15	13.9	Apr. 10-12.	
Missouri Basin						
Big Sioux: Akron, Iowa.	12	Mar. 5	Mar. 16	18.7	Mar. 12.	
Floyd: Merrill, Iowa.	13	Mar. 6	Mar. 11	14.5	Mar. 10.	
Platte: Ashland, Nebr.	7	Mar. 5	Mar. 5	7.4	Mar. 5.	
Missouri: Nebraska City, Nebr.	15	Mar. 6	Mar. 7	15.2	Mar. 6.	
Ohio Basin						
Stony Creek: Johnstown, Pa.	15	Mar. 17	Mar. 18	30.2	Mar. 17.	
Kiskiminetas: Saltsburg, Pa.	8	do	do	33.1	Mar. 18.	
Allegheny:						
Olean, N. Y.	12	[Mar. 19	Mar. 20	12.8	Mar. 19.	
Warren, Pa.	12	Mar. 27	Mar. 29	13.9	Do.	
Franklin, Pa.	17	do	Mar. 28	18.9	Do.	
Lock No. 8, Mosgrove, Pa.	24	Mar. 17	Mar. 19	37.6	Mar. 18.	
Lock No. 5, Schenley, Pa.	24	Mar. 17	Mar. 14	28.5	Mar. 12.	
Lock No. 4, Natrona, Pa.	24	Mar. 17	Mar. 20	43.6	Mar. 18.	
Lock No. 3, Acmetonia, Pa.	25	Mar. 17	Mar. 20	45.2	Mar. 18.	
Tygart:						
Elkins, W. Va.	14	[Mar. 25	Mar. 25	15.8	Mar. 18.	
Philippl, W. Va.	20	[Mar. 24	Mar. 25	19.1	Mar. 18.	
Youghiogheny:						
Connellsville, Pa.	13	Mar. 17	Mar. 18	20.3	Mar. 18.	
West Newton, Pa.	20	do	do	28.0	Do.	
Monongahela:						
Lock No. 15, Houlton, W. Va.	22	do	do	25.8	Mar. 17, 18.	
Lock No. 10, Morgantown, W. Va.	25	[Mar. 24	Mar. 25	25.3	Mar. 18.	
Lock No. 7, Greensboro, Pa.	30	Mar. 24	Mar. 26	39.3	Mar. 25.	
Lock No. 4, Charleroi, Pa.	30	[Mar. 17	Mar. 19	40.1	Mar. 18.	
McKeesport, Pa.	20	Mar. 17	Mar. 19	36.0	Mar. 25.	
Walhonding: Walhonding, Ohio.	8	Mar. 24	Mar. 25	10.3	Mar. 24.	
Tuscarawas: Coshocton, Ohio.	11	[Mar. 1	Mar. 1	12.6	Mar. 1.	
Muskingum:						
Lock No. 7, McConnelsville, Ohio.	22	Mar. 1	Mar. 1	22.1	Mar. 1.	
Lock No. 3, Lowell, Ohio.	25	Mar. 20	Mar. 22	28.2	Mar. 21.	
Lock No. 1, Marietta, Ohio.	35	[Mar. 18	Mar. 24	48.1	Mar. 20.	
Little Kanawha:						
Glenville, W. Va.	23	[Mar. 24	Mar. 25	24.8	Mar. 25.	
Creston, W. Va.	20	[Mar. 25	Mar. 25	20.3	Mar. 25.	
Hocking: Athens, Ohio.	17	do	do	17.9	Apr. 7.	
Gauley: Summersville, W. Va.	10	[Mar. 17	Mar. 18	15.5	Mar. 18.	
Elk: Clay, W. Va.	18	[Mar. 24	Mar. 28	14.7	Mar. 24.	
		[Mar. 25	Mar. 25	18.8	Mar. 18.	
		[Mar. 25	Mar. 25	23.1	Mar. 25.	

* Estimated.

Table of flood stages in March and April 1936—Continued

River and station	Flood stage	Above flood stages—dates		Crest		
		From—	To—	Stage	Date	
MISSISSIPPI SYSTEM—continued						
<i>Ohio Basin—Continued</i>						
Scioto:	Feet			Feet		
LaRue, Ohio.....	11	Mar. 25	Mar. 25	11.8	Mar. 25	
Prospect, Ohio.....	10	Mar. 26	Mar. 26	10.0	Mar. 26	
Circleville, Ohio.....	14	Mar. 25	do.....	15.5	Do.	
Barren: Bowling Green, Ky.....	20	Mar. 27	Mar. 29	21.5	Mar. 28	
Green:		(Apr. 11)	Apr. 12	21.0	Apr. 11	
Lock No. 6, Brownsville, Ky.....	28	Mar. 27	Mar. 30	29.4	Mar. 29	
Lock No. 4, Woodbury, Ky.....	33	Mar. 27	Mar. 31	39.2	Mar. 29	
Lock No. 2, Rumsey, Ky.....	34	Mar. 26	Apr. 1	40.8	Apr. 15, 16.	
West Fork—White River:						
Anderson, Ind.....	8	Mar. 25	Mar. 29	9.4	Mar. 28	
Elliston, Ind.....	18	do.....	Apr. 7	18.0	Do.	
Edwardsport, Ind.....	12	Mar. 23	Apr. 1	14.2	Mar. 30	
White:						
Petersburg, Ind.....	16	Mar. 28	Apr. 1	17.0	Mar. 30, 31.	
Hazleton, Ind.....	16	Mar. 28	Apr. 2	17.7	Mar. 31.	
Wabash: Lafayette, Ind.....	11	Mar. 26	Mar. 26	12.6	Mar. 26	
New: New River, Tenn.....	18	Mar. 25	Mar. 25	19.2	Mar. 25	
Cumberland:						
Williamsburg, Ky.....	19	do.....	Mar. 27	20.6	Mar. 25.	
Celina, Tenn.....	23	Mar. 26	Mar. 31	40.9	Mar. 28	
Carthage, Tenn.....	40	Mar. 28	Apr. 12	42.3	Mar. 29.	
Nashville, Tenn.....	40	Mar. 28	Apr. 11	40.5	Apr. 8.	
Clarksville, Tenn.....	46	Mar. 23	Apr. 9	43.4	Apr. 11.	
Lock F, Eddyville, Ky.....	50	Mar. 28	Apr. 4	48.2	Apr. 2.	
North Fork-Holston: Mendota, Va.....	8	Mar. 28	Apr. 20	60.0	Apr. 16.	
Holston: Rogersville, Tenn.....	13	Apr. 6	Apr. 7	9.7	Apr. 6.	
Pigeon: Newport, Tenn.....	6	Apr. 7	do.....	13.5	Apr. 7.	
French Broad:						
Rosman, N. C.....	8	do.....	Apr. 6	8.8	Do.	
Asheville, N. C.....	6	Mar. 26	Mar. 28	6.7	Mar. 26.	
Marshall, N. C.....	10	Apr. 2	Apr. 3	7.2	Apr. 2.	
Hot Springs, N. C.....	14	do.....	Apr. 6	8.0	Apr. 6.	
Oldtown (near Newport), Tenn.....	6	Apr. 2	Apr. 4	10.8	Apr. 2.	
Dandridge, Tenn.....	12	Apr. 2	Apr. 3	12.3	Apr. 6.	
Little Tennessee: McGhee, Tenn.....	18	Mar. 25	Mar. 28	15.1	Mar. 28.	
Hiwassee: Charleston, Tenn.....	22	Apr. 7	Apr. 8	25.3	Apr. 7.	
Tennessee:						
Knoxville, Tenn.....	20	Mar. 26	Mar. 29	23.8	Mar. 28.	
Loudon, Tenn.....	22	Mar. 27	Mar. 29	25.8	Mar. 28.	
Chattanooga, Tenn.....	30	Apr. 4	Apr. 5	30.4	Apr. 4.	
Hales Bar Lock, Tenn.:						
Upper gage.....	50	Mar. 29	Mar. 30	50.6	Mar. 30.	
Lower gage.....	30	Mar. 29	Mar. 31	31.9	Mar. 30.	
Bridgeport, Ala.....	18	Mar. 27	Apr. 12	25.8	Mar. 30.	
Widows Bar Lock, Ala.:						
Upper Gage.....	17	Mar. 26	Apr. 13	26.9	Mar. 30.	
Lower Gage.....	26	do.....	do.....	34.9	Do.	
Guntersville, Ala.....	25	Mar. 27	Apr. 14	35.5	Apr. 2.	
Decatur, Ala.....	20	Mar. 31	Apr. 13	22.5	Apr. 3.	
Florence, Ala.....	18	Mar. 30	Apr. 15	24.4	Apr. 6.	
Riverton Lock, Ala.....	33	Mar. 28	Apr. 18	47.7	Apr. 7.	
Savannah, Tenn.....	39	Apr. 2	do.....	47.4	Apr. 10.	
Johnsonville, Tenn.....	31	Apr. 4	Apr. 20	39.6	Apr. 12.	
Ohio:						
Pittsburgh, Pa.....	25	Mar. 25	Mar. 29	30.6	Mar. 26.	
Dam No. 2, Coraopolis, Pa.....	26	Mar. 17	Mar. 20	43.6 (25.9)	Mar. 18. Mar. 26.	

¹ Estimated.

Table of flood stages in March and April 1936—Continued

River and station	Flood stage	Above flood stages—dates		Crest		
		From—	To—	Stage	Date	
MISSISSIPPI SYSTEM—continued						
<i>Ohio Basin—continued</i>						
Ohio—Continued.	Feet			Feet		
Dam No. 6, Beaver, Pa.....	30	Mar. 17	Mar. 20	54.8	Mar. 19.	
Dam No. 12, near Wheeling, W. Va.....	36	Mar. 24	Mar. 29	37.7	Mar. 26.	
Dam No. 13, near Wheeling, W. Va.....	45	Mar. 18	Mar. 21	55.5	Mar. 19.	
Parkersburg, W. Va.....	36	Mar. 26	Mar. 28	39.6	Mar. 26.	
Dam No. 19, Little Hocking, Ohio.....	40	Mar. 18	Mar. 21	57.8	Mar. 19.	
Dam No. 20, near Belleville, W. Va.....	45	Mar. 19	Mar. 23	50.6	Mar. 21.	
Dam No. 22, Ravenswood, W. Va.....	44	Mar. 19	Mar. 24	52.1	Mar. 21.	
Dam No. 25, near Addison, Ohio.....	43	Mar. 28	Mar. 29	44.9	Mar. 22.	
Point Pleasant, W. Va.....	40	Mar. 18	Apr. 1	57.9	Mar. 22.	
Dam No. 26, Chambersburg, Ohio.....	50	Mar. 19	Mar. 31	61.2	Mar. 23.	
Dam No. 28, Huntington, W. Va.....	50	Mar. 20	do.....	58.6	Do.	
Dam No. 29, Ashland, Ky.....	51	do.....	Apr. 1	62.7	Do.	
Dam No. 30, Greenup, Ky.....	52	Apr. 7	Apr. 10	53.6	Apr. 8.	
Portsmouth, Ohio.....	50	Mar. 20	Apr. 1	59.2	Mar. 23, 24.	
Dam No. 32, near Vanceburg, Ky.....	53	Mar. 21	Apr. 1	59.4	Mar. 24.	
Dam No. 33, Maysville, Ky.....	50	Mar. 20	Apr. 2	59.1	Mar. 27.	
Dam No. 35, New Richmond, Ohio.....	48	Mar. 21	Apr. 6	56.5	Mar. 27, 28.	
Dam No. 36, Brent, Ky.....	52	Mar. 9	Apr. 12	49.9	Apr. 10.	
Cincinnati, Ohio.....	52	Mar. 21	Apr. 2	60.4	Mar. 28.	
Dam No. 37, Fernbank, Ohio.....	50	Mar. 21	Apr. 3	59.6	Mar. 28.	
Dam No. 38, Grant, Ky.....	51	Mar. 22	Apr. 3	59.1	Mar. 28.	
Dam No. 39, Markland, Ind.....	48	Mar. 23	Apr. 2	53.5	Mar. 28, 29.	
Dam No. 41, Louisville, Ky.:						
Upper Gage.....	28	Mar. 23	Apr. 4	36.6	Mar. 20, 30.	
Low-water Gage.....	51	Mar. 23	Apr. 4	59.6	Mar. 20, 30.	
Dam No. 43, Evans Landing, Ind.....	57	Mar. 24	Apr. 14	54.7	Mar. 21.	
Dam No. 44, Leavenworth, Ind.....	53	Mar. 22	Apr. 15	63.8	Mar. 29, 30.	
Dam No. 45, Addison, Ky.....	47	Mar. 23	Apr. 16	54.9	Mar. 30.	
Dam No. 46, Owensboro, Ky.....	41	Mar. 25	do.....	45.1	Mar. 31.	
Dam No. 47, Newburgh, Ind.....	38	Mar. 22	Apr. 19	46.7	Do.	
Evansville, Ind.....	35	do.....	Apr. 20	44.4	Do.	
Dam No. 48, Henderson, Ky.....	38	Mar. 23	do.....	46.7	Apr. 1.	
Dam No. 49, Uniontown, Ky.....	37	Mar. 25	Apr. 22	46.4	Apr. 4.	
Dam No. 50, Fords Ferry, Ky.....	34	Mar. 5	Mar. 11	36.2	Mar. 8.	
Dam No. 51, Golconda, Ill.....	40	Mar. 28	Apr. 22	47.8	Apr. 6.	
Paducah, Ky.....	39	Mar. 27	Apr. 23	49.1	Apr. 16.	
Dam No. 52, Brookport, Ill.....	37	Mar. 26	Apr. 24	50.9	Apr. 15, 16.	
Dam No. 53, Mound City, Ill.....	42	Mar. 25	Apr. 25	55.3	Do.	
Cairo, Ill.....	40	do.....	do.....	52.8	Apr. 16.	
<i>White Basin</i>						
Black: Black Rock, Ark.....	14	Apr. 6	Apr. 7	16.4	Apr. 6.	
<i>Lower Mississippi Basin</i>						
Big Lake Outlet: Manila, Ark.....	10	Apr. 11	Apr. 18	10.8	Apr. 14, 15.	
Tallahatchie: Swan Lake, Miss.:						
New Madrid, Mo.....	34	Mar. 28	Apr. 25	41.4	Apr. 13-18.	
Memphis, Tenn.....	34	Apr. 5	Apr. 28	39.3	Apr. 22.	
Helena, Ark.....	44	Apr. 7	Apr. 30	50.6	Apr. 22-24.	
Arkansas City, Ark.....	42	do.....	do.....	41.4	Apr. 27, 28.	
<i>Gulf of California Drainage</i>						
<i>Colorado Basin</i>						
Gunnison: Delta, Colo.....	9	Apr. 22	Apr. 24	9.3	Apr. 23.	
<i>Pacific Slope Drainage</i>						
<i>Columbia Basin</i>						
Clearwater: Kamiah, Idaho.....	12	Apr. 17	Apr. 26	13.6	Apr. 24.	